

### Energy Sector Power Distribution Division

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#### **Siemens to explore innovative options for connection of electric vehicles to public power supply grid**

**As a partner in an international consortium Siemens Energy is to investigate within the framework of the EDISON project innovative options for connecting electric vehicles to the public power supply grid. On February 25, 2009, the consortium signed a contract for the EDISON project with Energinet.dk, the operator of Denmark's gas and power transmission networks. The objective of the project is the standardization of energy stores and charging and discharging technologies for electric and plug-in hybrid vehicles. Beside Siemens, the consortium also comprises the Technical University of Denmark (DTU) and Risø-DTU, the university's research center for sustainable energies, the Danish research and development company Eurisco, the Danish utility Dong Energy and Østkraft as well as IBM. Consortium leader is the Danish Energy Association, the umbrella organization of Denmark's energy technology companies. The project focuses on a change from combustion engine vehicles to electro mobility utilizing eco-friendly renewable energy sources.**

Denmark currently meets 20 percent of its power demand with electricity generated using wind power. To make even better use of this fluctuating renewable energy in the future Denmark started the EDISON project for connecting electric vehicles to the power grid. EDISON stands for “**E**lectric vehicles in a **D**istributed and **I**ntegrated market using **S**ustainable energy and **O**pen **N**etworks”. The project not only focuses on feeding electric current from the public power grid into the batteries of electric and plug-in hybrid vehicles. In addition to a conventional combustion engine plug-in hybrid vehicles also feature an electric drive, whose battery can also be charged from the power grid. This project will also investigate whether, in times of high grid load, electric vehicles can return energy from their fully charged batteries to the power grid when they are not in use. Preliminary investigations have shown that over 90% of the millions of automobiles in industrialized countries are not in motion for comparatively long periods every day. If these were electric vehicles equipped with high-performance batteries, they could, given an appropriate infrastructure, be used as interim energy stores.

As a technology partner in this project Siemens is responsible for the coordination and provision of key technologies, which are to be developed, for example, for different types of charging stations including the control systems for optimum utilization of battery capacities. The power grid connection constitutes a special challenge because large amounts of energy have to flow quickly and bidirectionally to be able to use the electrical energy in the batteries also as balancing power. "We are gladly taking up this challenge. Because Siemens today already has in its standard portfolio the majority of the components and systems needed to set up an infrastructure for connecting electric vehicles to the power grid. Furthermore, we have the backing of comprehensive know-how in grid analysis, grid planning and grid automation," said Ralf Christian, CEO of the Power Distribution Division within Siemens Energy.

As an integrated technology company Siemens is heavily involved in electro mobility in its Corporate Technology department and in the Energy and Industry Sectors. The work focuses not only on the requirements made on the electric vehicle itself but also on the design of the infrastructure of the power grids. Areas under investigation include power generation and distribution, traffic and energy management, intelligent electricity meters, power electronics, software and sensors, and of course also the electric drives, and energy recovery and storage.

For example, electric vehicles could in the future establish themselves as a mobile, flexible feature of energy supply essentially independent of fossil fuels. Connected to the power grid these vehicles could compensate system fluctuations and not only store surplus energy from the power grid but, if necessary, also feed it back into the grid. Since electric drives by virtue of their high operating efficiency levels also utilize energy resources more efficiently than combustion engines, electro mobility could in the future become an important part of Siemens environmental portfolio. In fiscal 2008, the company posted revenues with environmental products and solutions totaling 19 billion euros – approximately a quarter of its total revenues.

The **Siemens Energy Sector** is the world's leading supplier of a complete spectrum of products, services and solutions for the generation, transmission and distribution of power and for the extraction, conversion and transport of oil and gas. In fiscal 2008 (ended September 30), the Energy Sector had revenues of approximately EUR22.6 billion and received new orders totaling approximately EUR33.4 billion and posted a profit of EUR1.4 billion. On September 30, 2008, the Energy Sector had a work force of approximately 83,500. Further information is available at: [www.siemens.com/energy](http://www.siemens.com/energy).